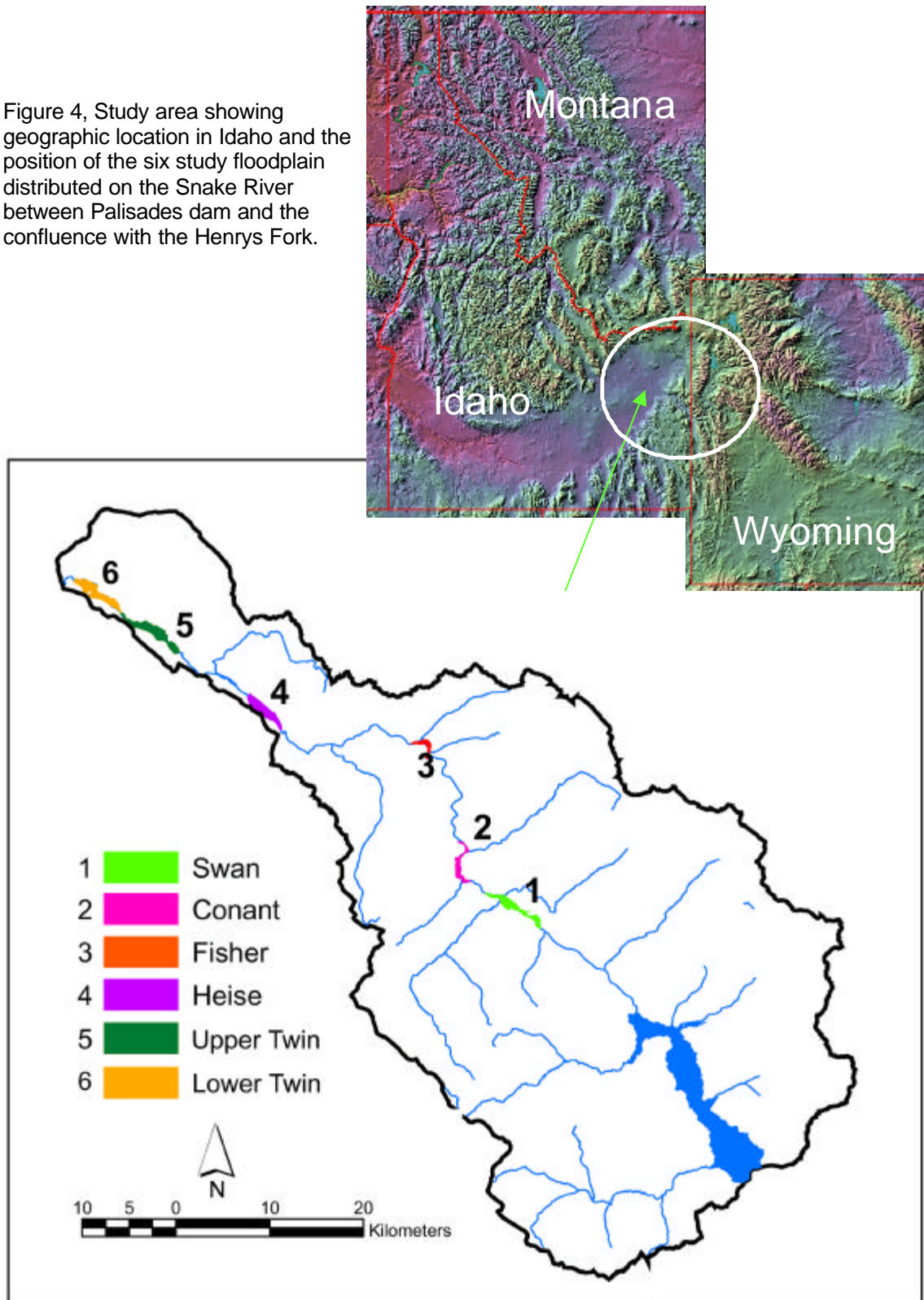


## STUDY AREA

### *Study Area Background*

This study was conducted on the river reaches of the Upper Snake River between Palisades Dam in southeastern Idaho and the confluence of the Upper Snake with the Henry's Fork near Ririe ID (Figure 4). This river segment is referred to locally in eastern Idaho as the "South Fork". The Upper Snake River (6<sup>th</sup> order), located in northwest Wyoming and southeastern Idaho, has a drainage basin of 5,810 mi<sup>2</sup> (15,048 km<sup>2</sup>) above Lorenzo ID. The Upper Snake River regulation and diversion projects including Palisades Dam are collectively referred to as the Minidoka Project, which furnishes irrigation water to more than 1 million acres of lands from five reservoirs. With origin in Yellowstone National Park, the Upper Snake River flows south through Grand Teton National Park and Jackson Lake. A combined concrete gravity and zoned earth-fill dam regulate the outlet of Jackson Lake. A temporary dam was built in 1906 and reconstructed 1910-11. Jackson Lake Dam impounds approx. 624,400 acre feet (770 million m<sup>3</sup>) and draws from a drainage area at the dam site of 1,824 mi<sup>2</sup> (4,724 km<sup>2</sup>). The principle purposes of the dam are irrigation storage and flood control. The Snake River then flows approximately 110 km to Palisades Reservoir. The Palisades Dam was constructed at Calamity Point in eastern Idaho about 11 miles west of the Idaho-Wyoming state line. The dam provides a supplemental water supply to about 670,000 acres of irrigated land in the Minidoka and Michaud Flats Projects. The Snake River has a drainage basin at Palisades Dam of 5,150 mi<sup>2</sup> (13,338 km<sup>2</sup>). The 176,600 kilowatt hydroelectric power plant furnishes energy to the Western US power grid, but the stated purpose of the power is to serve irrigation pumping units, municipalities, and

Figure 4, Study area showing geographic location in Idaho and the position of the six study floodplain distributed on the Snake River between Palisades dam and the confluence with the Henrys Fork.



rural cooperatives in the project area. Power not needed for Reclamation project purposes is marketed in the Federal Southern Idaho Power System administered by the Bonneville Power Administration. The Upper Snake River drains the primarily montane landscape of western Wyoming and eastern Idaho. The river corridor is typical of the interior West, where the river sequentially alternates between confined and unconfined reaches.

The management of the public land below the Dam to Heise is primarily administered by the Bureau of Land Management (BLM) and US Forest Service (USFS). Management actions for these public lands are under the guidance of the Snake River Plan (BLM and USFS), the Medicine Lodge Resource Management Plan (BLM), and the Targhee Forest Management Plan (USFS).

The information on Palisades Dam and Reservoir provided here has been summarized from the Reclamation website <http://dataweb.usbr.gov/html/palisades.html>. Palisades Dam is a large zoned earth-fill structure 270 feet high and has a crest length of 2,100 feet. The spillway is a 28-foot-diameter tunnel through the left abutment, with a capacity of 48,500 cfs (1373.4 cms). The outlet works and power inlet structures are controlled by a fixed-wheel gate at the entrances of the inclined shafts leading to 26-foot-diameter tunnels. The outlet tunnel conveys the water to the steel manifold transition section, where it is released to the stilling basin by regulating gates. At the lower end of the power tunnel, the water may be released to the stilling basin or to four penstocks and conveyed to the turbines for power generation. The capacity of the outlet works is 33,000 cfs (934.5 cms). The dam creates a reservoir of 1,401,000 acre-feet capacity. The preconstruction phase of the Palisades Dam project was started early in 1945. Construction was delayed until the close of World War II. Actual construction of the project was initiated in 1951 and completed in 1957. The project was initially authorized by the Secretary of the Interior on

December 9, 1941, under the provisions of Section 9 of the Reclamation Project Act of August 4, 1939 (53 Stat. 1187, Public Law 76-260). Reauthorization of the project by the Congress occurred on September 30, 1950 (64 Stat. 1083, Public Law 81- 864), substantially in accordance with a supplemental report approved by the Secretary of the Interior on July 1, 1949. The authorized purposes of the Palisades Project are flood control, irrigation, power, and fish and wildlife habitat.

Palisades Dam provides holdover storage during years of average or above average precipitation for release in ensuing dry years to lands served by diversions from the river above Milner Diversion Dam. In 1994, the United States entered into a contract with Mitigation, Inc., which provided that entity with non-contracted irrigation storage space in Palisades (18,980 acre-feet) and Ririe (80,500 acre-feet) Reservoirs. This agreement was made in order to protect existing non-Indian water users from adverse effects that might result from implementation of the 1990 Fort Hall Indian Water Rights Agreement and Fort Hall Indian Water Rights Act of 1990 (104 Stat. 3061, Public Law 101-602). In 1991, the State of Wyoming entered into a contract with Reclamation for the purchase of 33,000 acre-feet of "joint use" space in Palisades Reservoir. All Palisades Reservoir spaceholder contracts provide: 1) for use of a proportionate share of the water accruing to the Palisades Reservoir water rights, 2) for keeping unused stored water for use in subsequent years, and 3) the option of participating in the Water District 1 Rental Pool. Wyoming also has the option of making exchanges to allow the use of their Palisades Reservoir space to retain water in Jackson Lake or to increase winter flows in the Snake River to benefit cutthroat trout. The Palisades Reservoir space also insures Wyoming's ability to fulfill Snake River Compact obligations. It is also important to recognize that the flow regimes throughout the Upper Snake are operationally interconnected. Thus, recommended

flows from Palisades will affect discharge regimes from Jackson Lake. However, those impacts have not been addressed through this effort. In contrast, such an effort is currently in progress on the river reaches between the Henrys Fork and American Falls Reservoir.

### *Study Area Floodplains*

We identified six major floodplain reaches in the Snake River between Palisades Dam and the confluence with the Henrys Fork (Figure 4). These floodplains are referred throughout this report, beginning with the floodplain closest to the dam as: Swan, Conant, Fisher, Heise, Upper Twin and Lower Twin.

Within each of these floodplains there are several morphological and vegetative features that are important characteristics and will be referred to throughout this report. The near channel portion of the floodplain that is regularly inundated above base flow and is frequently scoured by the regular gravel and cobble-bed movement of the substratum is referred to as the Parafluvial. Next to the Parafluvial region of the channel-floodplain complex is that portion of the floodplain that may be regularly inundated, but generally there is insufficient power to scour the floodplain sediments. This region of the floodplain is characterized by riparian vegetation, particularly a mature or maturing gallery forest. This region is referred to as the Orthofluvial. Both the Parafluvial and the Orthofluvial contain a variety of aquatic habitats (e.g., springbrooks, ponds, inundation channels) that are a function of the legacy of past geomorphic processes on the floodplain.